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AUTHOR Perry, Joseph D.; And Others
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ABSTRACT

Two samples of 50 kindergarten children each were tested for IQ, reading and arithmetic achievement, and rated by teachers for social and academic competence. The children were tested again in third grade for reading, spelling, and arithmetic achievement, and rated for classroom coping behaviors. In addition, one kindergarten sample was rated for interest and participation versus apathy and withdrawal, and rated for cooperation and compliance versus anger and defiance. All of the kindergarten tests and ratings had significant positive correlations with the third grade achievement test scores and almost all had significant negative correlations with the "dependency" score in the third grade Schedule for Classroom Activity Norms (SCAN). The kindergarten rating for interest and participation, however, had the highest correlation of any of the predictors for third grade achievement test scores. Also, although IQ (Stanford-Binet) was the next best predictor of third grade arithmetic achievement, it did not predict reading or spelling as well as the kindergarten measures of social and academic competencies. Peer acceptance was the best single predictor of dependency behavior, with IQ adding to this prediction. (CTM)

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KINDERGARTEN COMPETENCIES AS PREDICTORS OF THIRD GRADE ACHIEVEMENT-RELATED BEHAVIORS AND ACADEMIC ACHIEVEMENT

Joseph D. Perry, John Guidubaldi, and Thomas J. Kehle
Kent State University

To investigate the relationships between preschool competencies and later academic functioning, multiple regression analyses were conducted using kindergarten intellectual, academic and social variables to predict third grade classroom behavioral patterns and achievement. A random sample (N=50) of 184 third grade children evaluated during the 1973-74 kindergarten year and a second sample (N=49), also a subgroup, with additional time-1 social and background variables were included. Subjects were observed in classrooms and administered achievement tests during the 1976-77 school year. Results indicate that kindergarten social and academic competencies surpassed IQ as predictors of later achievement-related behaviors and achievement.

This study represents a 3-year longitudinal investigation of the relationship between kindergarten competencies and third grade academic functioning. This attempt to provide greater understanding of the relative predictive values of various school entry abilities which contribute to later scholastic success could provide guidance for preschool educators in developing more effective programs. Further, preventative intervention in the early elementary grades and such trends in the behavioral sciences as multifactored assessment require knowledge of the optimal combination of various early competencies and their interrelations. Such combinations may provide a better basis for predicting subsequent learning than that afforded by unitary predictor variables.

The need for criterion variables in addition to academic achievement was pointed out by Bloom (1976) in relation to his comprehensive theory of human characteristics and school learning. The theory emphasizes the history of the learner and generally stipulates that effective instruction requires knowledge of learner's cognitive and affective characteristics, both as school entry and outcome variables. Cognitive behaviors were defined as academic competencies, and affective entry characteristics emphasized motivation for learning. Bloom concluded from a review of

longitudinal research that few studies have compared major school entry competencies as predictors and included affective outcomes with academic achievement as criterion variables.

A recent longitudinal study by Stevenson, Parker, Wilkinson, Hegion, and Fish (1976a) compared the predictive significance among a comprehensive battery of academic, cognitive, and psychometric assessments in addition to teacher ratings. The assessments and teacher ratings were administered from a period just prior to kindergarten through the third grade. The major results indicated that specific academic and cognitive abilities were consistently better predictors of achievement at the first, second and third grades than numerous psychometric measures (e.g., IQ) and teacher ratings. Stevenson et al. (1976b) indicated that kindergarten teacher ratings had highly significant separate relationships to later achievement, especially ratings of cognitive abilities in comparison to those of classroom skills and social competencies. However, direct measures of specific cognitive and academic abilities were the best predictors. The most frequently occurring, successful predictor of later achievement was prereading skills measured by the Wide Range Achievement Test (WRAT).

Contrary to the above findings, Feshbach, Adelman, and Fuller (1977), more recently found that kindergarten teacher ratings generally had equal or higher predictive values than direct measures of kindergarten cognitive and psychometric abilities on reading achievement at the first, second and third grades. Feshbach et al. suggested that kindergarten teacher ratings derived from the Student Rating Scale (SRS) of their study were more accurate than the teacher rating measures employed in the Stevenson et al. study, thus accounting for the differences in the findings. The SRS measures classroom behavioral patterns and cognitive abilities. The Kohn Social Competence Scale (Kohn, 1968) was also included in the kindergarten teacher ratings. Correlations for the SRS with reading achievement at the first, second and third grades ranged from .39 to .52 while those of Factor I of the Kohn Scale were from .20 to .33. The range of correlations for IQ and the various cognitive abilities with the criterion was from .32 to .48. It was noted that preacademic skills which were the best single predictors in the Stevenson et al. study were not included in this study.

The principal difference of the present study from these closely related previous ones is the inclusion of achievement-related behaviors with academic achievement at the third grade level as criterion variables. This inclusion required a preliminary research endeavor prior to conducting analyses relevant to the major goal of the study. Several issues were also encountered when interpreting such behavioral data. For example, recent studies have identified achievement-related behaviors which were shown to represent an adaptive, stable approach to learning which is largely independent of IQ (Harper, 1976; McKinney, Mason, Perkerson,

and Clifford, 1975; Myers, Attwell, and Orpet, 1968). However, closer examination by Hall, Huppertz, and Levi (1977) and Harper (1976) indicates that situational factors may influence the identification and stability of achievement-related behaviors (e.g., classroom environment, time of school year, and methodology employed). However, despite these complexities, the critical need to include criteria which reflect "more stable affective outcomes" with academic achievement is being addressed (Bloom, 1976, p. 140).

Hence, the present study may have major theoretical and practical significance. Evidence could be provided concerning the separate and combined influence of major school entry and outcome variables in Bloom's theory. Although achievement-related behaviors as criterion variables do not directly represent affective characteristics of children, such meaning may be interpreted from the behavioral observation methodology employed. The Schedule for Classroom Activity Norms (SCAN) developed by McKinney et al. (1975) includes such categories as constructive self-directed activity and dependency. An independent child exhibiting high frequencies of constructive self-directed activity may be demonstrating the affective characteristic of achievement motivation and independence to a higher degree than one who frequently seeks assistance. Such specific characteristics measured in terms of overt classroom behavior are more likely to be amenable to intervention than global affective traits. Motivation for learning as an affective school entry characteristic is included as a predictor variable primarily by Factor I (Interest - Participation versus Apathy - Withdrawal) of the Kohn and Rosman Social Competence Scale (1972b). Psychometric measures such as the Wide Range Achievement Test were administered at the end of kindergarten and the third grade as indications of cognitive entry and outcome variables.

METHOD

Subjects

During the spring of the 1973-74 school year, (Time-1), 211 kindergarten children were evaluated using the Stanford - Binet Intelligence Scale (Terman and Merrill, 1973). Wide Range Achievement Test (Jastak, Bijou, and Jastak, 1965), teacher ratings of academic readiness, and the Sells Teacher Rating Scale of Peer Relations (Sells and Roff, 1967). That sample of 211 children comprised the total kindergarten enrollment of two local school districts in Trumbull County, Ohio. A questionnaire concerning family background and early development was mailed to 96 parents of the kindergarten children. From this sample of 96, 61 questionnaires were returned. The Kohn and Rosman Social Competence Scale (Kohn and Rosman, 1972a) was completed by the teachers of the 61 children.

The present study includes two follow-up samples selected from the 184 remaining subjects attending the third grade during the 1976-77 school year (Time-2). A random sample of 50 children was selected. The second sample consisted of 49 children remaining of the original 61 whose parents had returned the questionnaire at Time-1. This sample was included in order to investigate the predictive significance of the additional social competence variables. Relevant data for each of these samples are as follows:

Random Sample. This sample of third grade children had a mean age of 108.5 months and a mean IQ as measured by the Stanford-Binet Intelligence Scale of 100.9 (SD=13.8). This sample includes 25 girls and 25 boys due to stratification prior to random selection.

Questionnaire Sample. The mean age of this sample of third grade children was 108.7 months and their mean IQ as measured by the Stanford-Binet Intelligence Scale was 102.2 (SD=13.2). This sample includes 25 girls and 24 boys. It was possible to gain further relevant information from the parents of this sample during the 1973-74 school year. The mean occupational status rating as measured by the Hollingshead Index of Social Position (Hollingshead and Redlich, 1958) was 3.50 (SD=.68). This index includes five socioeconomic levels for occupation of father, and this sample represents families from the middle class. The average educational level of the father was at the college attendance level with approximately 30 per cent graduating from college and all graduating from high school. The mean educational level of the mothers was at the high school graduate level with little variance.

Predictor Measures (Time-1 Variables)

Stanford-Binet Intelligence Scale, Form L-M. This test was individually administered and scored according to the 1972 normative edition as a measure of intellectual competence.

Wide Range Achievement Test (WRAT). The reading and arithmetic subtests of the WRAT were used to measure academic competence. At the kindergarten level, the reading tasks primarily involve naming letters, matching letters, and identifying two letters of their name. Some of the children could also recognize words. On the arithmetic section, kindergarten children typically completed basic tasks such as counting dots although some were able to complete basic computations.

Teacher ratings of academic competence. Teacher ratings were employed as an additional indication of kindergarten academic competence. Teachers were asked to rate each child's global academic competence in comparison to his classmates. A four-point scale was used according to quartile rank.

Sells and Roff Scale of Peer Relations. A teacher rating scale developed by Sells and Roff (1967) was used as a measure of social competence. This scale includes instructions for teachers to evaluate the degree a child is accepted or rejected by peers according to seven categories ranging from oustanding peer relations to rejected entirely by peers. Roff, Sells, and Golden (1972) report the results of studies that indicate reliability of .58 to .75 and correlations of .57 between teacher ratings and peer choice scores.

Kohn and Rosman Social Competence Scale. This indication of social competence was adapted from Kohn and Rosman (1972a) who isolated two factors labeled Interest and Participation versus Apathy and Withdrawal (Factor I), and Cooperation and Compliance versus Anger and Defiance (Factor II). These factors reflect children's relationships with their teacher and peers as well as their approach to classroom activities. This predictor measure was available for only the questionnaire sample.

Criterion Measures (Time-2 Variables)

Schedule for Classroom Activity Norms (SCAN). The SCAN was developed by McKinney et al. (1975) and represented an extension of the Coping Analysis Schedule for Educational Settings (CASES) devised by Spaulding (1970). This observational system calls for children to be observed during classroom academic activities for 5-minute periods on 4 separate occasions for a total of 20 minutes. Observers are to record the occurrence of behavior by students in one of twelve categories every 10 seconds. Seven observers were trained in a single, three-hour session using videotapes of children in actual classroom sessions. A separate videotape segment was used to determine observer reliability. Reliability was calculated by the percentage method where observers had to agree by code category and sequence with a master record previously completed by the author. The reliability for the seven observers ranged from 68% to 77% with an average reliability of 74%.

Wide Range Achievement Test (WRAT). The WRAT was individually administered at Time-2 for an indication of third grade academic achievement. The reading, spelling, and arithmetic subtests of the 1976 edition were administered to subjects in both samples following observations. The reading section requires word recognition skills where the child reads words. In the spelling section children write out words orally read by the examiner. The math section involves the written completion of numerical computations. All portions of the test have items arranged in hierarchal order of difficulty.

RESULTS

The data were subjected to correlational and multiple regression analyses. Table 1 includes the means and standard deviations for all Time-1 and Time-2 variables.

TABLE 1

Means and Standard Deviations of Time-1 and Time-2 Variables

Variable	Questionnaire Sample M	Questionnaire Sample SD	Random Sample M	Random Sample SD
Time-1 Variables				
Stanford-Binet IQ	102.16	13.16	100.94	13.80
WRAT Reading	98.16	10.53	99.50	13.79
WRAT Math	100.02	12.36	99.26	13.50
Teacher Rating	2.27	.91	2.36	.94
Peer Status	3.51	.79	3.42	.78
Social Factor I	26.10	13.18	--	--
Social Factor II	-5.69	6.53	--	--
Time-2 Variables				
WRAT Reading	107.31	11.64	106.20	12.55
WRAT Spelling	103.16	11.28	103.64	11.88
WRAT Math	100.69	8.22	99.74	8.01
(SCAN Behaviors)				
Constructive activity	52.04	17.11	48.38	19.31
Attending	30.02	17.25	35.96	18.37
Constructive play	7.31	10.59	5.36	7.37
Task-oriented interaction	4.71	5.10	5.94	6.94
Nonconstructive activity	4.45	5.30	4.22	4.44
Distractibility	11.51	5.93	10.40	6.03
Passive responding	4.24	5.53	3.02	5.39
Gross motor	1.41	1.91	1.80	2.59
Social interaction	2.22	3.64	2.20	3.12
Dependency	1.78	5.49	2.18	5.75
Aggression	.14	.61	.04	.20
Teacher interaction	.29	1.04	.42	1.54

Identification of Achievement-Related Behaviors

Attempts to identify achievement-related behaviors as criterion variables were only minimally successful. Of the 12 SCAN behaviors, dependency was found to have the strongest relationship to achievement and the least redundancy with IQ in predicting achievement. As can be seen from Table 2, dependency related significantly to all three achievement criteria. Of six possible correlations for the two samples, five were significantly related in inverse fashion. Furthermore, it can be observed that the magnitude of these correlations compares favorably with expected significant predictions from IQ scores. No other SCAN behaviors predicted achievement criteria consistently in both samples.

TABLE 2

Correlations of Third Grade Dependency Behavior and Kindergarten IQ Scores with Third Grade WRAT Scores

Sample	Variable	WRAT Reading	WRAT Spelling	WRAT Math
Random	Dependency	-.32*	-.42**	-.56**
	IQ	.44**	.41**	.53**
Questionnaire	Dependency	-.24	-.37**	-.48**
	IQ	.37**	.25	.48**

*$p < .05$
**$p < .01$

To determine the predictive value of SCAN behaviors independent of IQ, regression analyses were performed with third grade WRAT scores as criteria. The IQ variable was entered first in the three equations. Consistent with the previous correlational analysis, these regressions demonstrate that dependency is the most powerful predictor from the SCAN instrument. To qualify for inclusion as an achievement-related classroom behavior, a SCAN behavior was required to add a significant amount of independent variance to at least one WRAT score consistently for both samples. The only behavioral variable to meet this rather stringent prerequisite was dependency as illustrated by the prediction of math scores shown in Table 3. For the two samples, the addition of the dependency variable resulted in an improvement in variance accounted for of 12% and 10% over that contributed by IQ alone.

TABLE 3

Prediction of Third Grade WRAT Math
Scores Using SCAN and IQ Variables

Sample	Variable Entered	Simple r	Multiple R	Multiple R^2	Increase in R^2	Improving F
Random	IQ	.53	.53	.28	--	18.58**
	Dependency	-.56	.63	.40	.12	9.63**
Questionnaire	IQ	.48	.48	.23	--	14.30**
	Dependency	-.48	.57	.33	.10	6.39*

*$p < .025$
**$p < .01$

Correlations Between Major Time-1 and Time-2 Variables

Table 4 presents the results of correlations between major predictor and criterion variables for the random and questionnaire samples. All kindergarten competencies had significant relationships to later measures of academic achievement as hypothesized. Moreover, the single behavioral criterion, dependency, was also consistently related to early competencies for both samples, i.e., low frequency of third grade assistance seeking behavior was associated with high levels of kindergarten competencies. Also noteworthy is the finding that academic and social competencies predicted the criterion variables as well as or better than IQ. For example, Factor I of the Kohn Social Competence Scale (Interest-Participation versus Apathy - Withdrawal) resulted in higher correlations with the criterion variables than those produced by IQ.

TABLE 4

Correlations of Selected Time-1
and Time-2 Variables

		Time-2 Variables			
Sample	Time-1 Variables	WRAT Reading	WRAT Spelling	WRAT Math	Dependency
Random	IQ	.44**	.41**	.53**	-.47**
	WRAT Reading	.49**	.49**	.43**	-.37**
	WRAT Math	.52**	.48**	.48**	-.34*
	Teacher Rating	.51**	.36*	.45**	-.33*
	Peer Status	.25	.39**	.38**	-.51**
Questionnaire	IQ	.37**	.24	.48**	-.42**
	WRAT Reading	.36*	.35*	.34*	-.32*
	WRAT Math	.51**	.32*	.42**	-.26
	Teacher Rating	.50**	.38**	.48**	-.32*
	Peer Status	.29*	.34*	.39**	-.47**
	Social Factor I	.51**	.43**	.65**	-.36*
	Social Factor II	.37*	.28	.44**	-.15

*$p < .05$ **$p < .01$

Although the single order, cross-time correlations presented here were substantial, previous research indicates a strong likelihood of significant intercorrelations among the predictor variables. To determine the degree to which these variables may present redundant predictive information, intercorrelations and regression anlyses were performed. Tables 5 and 6 present intercorrelation matrixes for both samples. As evidenced by these analyses, predictor variables were in fact highly intercorrelated.

TABLE 5

Intercorrelations of Time-1 Competencies for the Random Sample

Variable	IQ	WRAT Reading	WRAT Math	Teacher Rating	Peer Status
IQ		.56*	.67**	.63**	.42**
WRAT Reading			.81**	.39**	.45**
WRAT Math				.54**	.50**
Teacher Rating					.51**
Peer Status					

**$p < .01$

TABLE 6

Intercorrelations of Time-1 Competencies for the Questionnaire Sample

Variable	IQ	WRAT Reading	WRAT Math	Teacher Rating	Peer Status	Social Factor I	Social Factor II
IQ		.43**	.60**	.36*	.29*	.40**	.29*
WRAT Reading			.58**	.08	.07	.13	.10
WRAT Math				.41*	.30*	.43**	.29*
Teacher Rating					.39**	.71**	.50**
Peer Status						.59**	.32*
Social Factor I							.60**
Social Factor II							

*$p < .05$
**$p < .01$

Regression Results Using Time-1 Variables to Predict Third Grade Achievement and Dependency Behavior

Regression analyses provided an opportunity to compare the relative power of the kindergarten competencies as predictors of both later achievement and the identified achievement related behavior, dependency. Table 7 illustrates that kindergarten peer status as measured by the Sells and Roff Scale accounts for 26% of the variance in dependency for the

random sample and 22% for the questionnaire sample. The addition of IQ provided an increase of 8% and 9% respectively over that accounted for by peer status alone. Thus, low social and intellectual competence were predictive of high dependency behavior.

TABLE 7

Prediction of Third Grade Dependency Behavior Using Time-1 Variables

Sample	Variable Entered	Simple r	Multiple R	Multiple R^2	Increase in R^2	Improving F
Random	Peer Status	-.51	.51	.26	--	17.07**
	IQ	-.47	.59	.34	.08	5.94*
Questionnaire	Peer Status	-.47	.47	.22	--	13.41**
	IQ	-.42	.56	.31	.09	5.79*

*$p < .025$
**$p < .01$

Tables 8-10 present results indicating that measures of all three Time-1 competencies significantly predict later academic achievement. For the questionnaire sample, social competence as measured by Factor I of the Kohn and Rosman Scale (Interest-Participation versus Apathy-Withdrawal) consistently entered as a significant predictor of the three WRAT subtests. The random sample did not include the Kohn and Rosman Scale as a Time-1 variable and had measures of academic competence predicting two of the WRAT subtests. Kindergarten IQ scores entered as a significant predictor of later math achievement for the random sample.

TABLE 8

Prediction of Third Grade WRAT Reading Scores Using Time-1 Variables

Sample	Variable Entered	Simple r	Multiple R	Multiple R^2	Increase in R^2	Improving F
Random	WRAT Math	.52	.52	.27	--	18.13**
	Teacher Rating	.51	.58	.35	.08	5.20*
Questionnaire	WRAT Math	.51	.51	.26	--	16.44**
	Social Factor I	.52	.61	.36	.10	7.42**

*$p < .05$
**$p < .01$

Results presented in Table 8 demonstrate that kindergarten WRAT math scores were the best predictor of third grade WRAT reading scores for the random and questionnaire samples accounting for 27% and 26% of variance respectively. For the random sample, kindergarten teacher ratings of academic competence increased the prediction of reading by 8%. These Time-1 academic competence measures together accounted for 35% of the variance. Factor I of the Kohn and Rosman Social Competence Scale (Interest - Participation versus Apathy-Withdrawal) combined with math scores to predict 36% of the variance in later reading scores for the questionnaire sample. All variables were positively related to the criterion indicating that high kindergarten academic and social competence predict reading success at the third grade level.

TABLE 9

Prediction of Third Grade WRAT Spelling Scores Using Time-1 Variables

Sample	Variable Entered	Simple r	Multiple R	Multiple R^2	Increase in R^2	Improving F
Random	WRAT Reading	.49	.49	.24	--	14.80**
Questionnaire	Social Factor I	.43	.43	.19	--	10.72**
	WRAT Reading	.35	.53	.28	.09	5.71*

*$p < .025$
**$p < .01$

The regression analysis in Table 9 for the random sample indicates that kindergarten WRAT reading scores were the only significant predictor of third grade WRAT spelling scores, accounting for 24% of the variance. The social competence Factor I (Interest - Participation versus Apathy - Withdrawal), not included for the random sample, combined with reading achievement to predict 28% of the variability in later spelling scores for the questionnaire sample. These results indicate that academic and social competence at Time-1 predict subsequent success at third grade spelling.

TABLE 10

Prediction of Third Grade WRAT Math Scores Using Time-1 Variables

Sample	Variable Entered	Simple r	Multiple R	Multiple R^2	Increase in R^2	Improving F
Random	IQ	.53	.53	.28	--	18.58**
Questionnaire	Social Factor I	.65	.65	.42	--	34.10**
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

**$p < .01$

For the random sample, IQ was the only significant predictor of WRAT math scores accounting for 28% of the variance as reported in Table 10. For the questionnaire sample, social competence Factor I (Interest-Participation versus Apathy-Withdrawal) predicted 42% of the variance in math scores. High intellectual and social competence at the kindergarten level, hence, predict third grade math functioning.

DISCUSSION

As indicated earlier, dependency was the sole behavioral criterion variable to meet the stringent prerequisites for inclusion in this study. Previous studies have found several SCAN behaviors to be related to achievement in addition to, and independent of, IQ (Harper, 1976; McKinney et al., 1975). The present finding, similar to the results of Harper (1976), and McKinney et al. (1975) studies, was that dependency was associated with achievement. However, McKinney et al. found dependency to be negatively related to achievement and Harper found dependency to be positively related to achievement. The findings of the present study are similar to those of McKinney et al. This supports the influence of classroom environments on achievement-related behaviors since observations in the McKinney et al. study and the present study took place in "structured" classrooms while those of the Harper study were "open." In addition, the mean IQ of children in the Harper study was 120 whereas the mean IQ's of children in the two samples of this study and the McKinney et al. study were representative of average peer groups (i.e., 101, 102, and 99 respectively.

The major results demonstrated that generally all kindergarten competencies had significant independent correlations with measures of third grade achievement and dependency behavior. However, the kindergarten competencies were also highly interrelated. Hence, there is considerable redundancy in the information provided by the separate correlations of Time-1 competencies and Time-2 criterion variables. The results of multiple regression analyses minimized this redundancy and more directly compared the relative predictive values of the kindergarten competencies on third grade academic achievement and dependency behavior.

In most analyses, a social or academic competence variable provided a prediction that could not be greatly improved by inclusion of additional Time-1 competencies. Social competence Factor I (Interest - Participation versus Apathy - Withdrawal) was the most frequently occurring optimal predictor of third grade academic achievement. Kindergarten WRAT reading and math scores were typically the best single predictors of third grade achievement for the random sample which didn't include Social Competence Factor I. For the prediction of dependency behavior, peer acceptance entered as the best single predictor for both samples with IQ adding to the prediction.

These findings present many similarities and contrasts to previous research particularly in regard to those studies showing IQ to be the best single indicator of a child's likelihood of success in school (e.g., Lavin, 1965). This has been substantiated by recent related longitudinal studies comparing the predictive values of kindergarten competencies on third grade achievement (Feshbach et al., 1977; Stevenson et al., 1976a, 1976b). Corroborative findings are also provided by these studies concerning the ability of kindergarten teacher ratings of competencies to predict later academic achievement. However, the present finding that kindergarten teacher ratings of social competencies are a better predictor of achievement than ratings of cognitive abilities or global academic competencies is directly contrary to both former studies as well as other research. For example, the independent correlations of Factor I and third grade achievement ranged from .43 to .65 in the present study while those of related studies were .20 to .36 for Factor I and later achievement (Feshbach et al., 1977; Guidubaldi, 1969; Kohn, 1977; Kohn and Rosman, 1972b). The range of correlations between peer status and later achievement in the present study was consistent with those reported for somewhat older subjects by the developers of the peer scale used (Roff et al., 1972; Sells and Roff, 1967). The present findings that these kindergarten social competencies could also predict dependency behavior across three years is unique to this study.

The present results regarding the predictive utility of reading and math skills measured by the WRAT at kindergarten on later achievement is similar to those of Stevenson et al. (1976a). This suggests a high stability of achievement during the early elementary school years (i.e., 5 to 9 year olds). More importantly, the preacademic skills measured by the WRAT at the kindergarten level (e.g., letter identification) have been consistently shown to predict not only later WRAT reading scores but more generalized achievement such as reading comprehension (Barrett, 1965; Blackman and Burger, 1972; Jansky and deHirsch, 1972). The finding that kindergarten teacher ratings of global factors such as school readiness can successfully predict later academic performance is similar to several recent studies (Flook and Velicer, 1977; Keogh and Smith, 1970; Stevenson et al., 1976b).

The general results of this study support major theoretical premises presented by Bloom (1976). Specifically, Bloom estimated from the available evidence that academic and affective school entry competencies together account for up to two-thirds of the variability in later learning outcomes. Bloom also pointed out the need to separate early competence predictors from intractable global aptitude measures such as IQ scores. The present study provides evidence that prerequisite early academic skills and such affective characteristics as initiative and positive social relations with peers are associated with later successful school performance. Hence, early elementary intervention to promote such abilities may facilitate later school success.

Kohn and Rosman (1972b) have suggested that "the relationship between Factor I and intellectual functioning predates the child's entry into formal schooling and has its beginning early in the child's development, probably during the first 3 years of life" (p. 452). White and Watts (1973) have provided evidence that a similar construct of intrinsic curiosity during the early years is critical for the development of later general competence. The present findings indicate that upon entry into school, a child's initiative, interest or intrinsic motivation may be of paramount importance for later success in school. Hence, the findings support the current shift in goals for preschool education noted by Evans (1975) to the traditional "whole child" approach which emphasizes non-intellective factors such as social competence.

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